

## WHAT IS CLAIMED

1. Light wave converter assembly comprising:

a light guide, and

a light wave converter

wherein the light wave converter exhibits a converter substance operable to convert a part of incident light into light of a longer wavelength, whereby the converted light is guided together with a portion of the unconverted light to an exit port; and the light, converted by the converter substance, together with the unconverted light yields a light with the wavelength spectrum of the color white.

2. Light wave converter assembly, as claimed in claim 1, wherein the incident light exhibits a wavelength ranging from 380 to 520 nm.

3. Light wave converter assembly, as claimed in claim 1, further comprising a band pass filter.

4. Light wave converter assembly, as claimed in claim 2, further comprising a band pass filter.

5. Light wave converter assembly, as claimed in claim 1, comprising a brightness controller.

6. Light wave converter, as claimed in claim 2,  
comprising a brightness controller.

7. Light wave converter, as claimed in claim 3  
comprising a brightness controller.

8. Light wave converter assembly, as claimed in claim 1,  
wherein the incident light is generated by a polymerization lamp  
as a light source.

9. Light wave converter assembly, as claimed in claim 2,  
wherein the incident light is generated by a polymerization lamp  
as a light source.

10. Light wave converter assembly, as claimed in claim 3,  
wherein the incident light is generated by a polymerization lamp  
as a light source.

11. Light wave converter assembly, as claimed in claim 5,  
wherein the incident light is generated by a polymerization lamp  
as a light source.

12. Light wave converter assembly, as claimed in claim 1,  
wherein the converter substance is chosen from substances, which,  
when optically excited, can luminesce, in particular fluoresce.

13. Light waver converter assembly, as claimed in claim 2, wherein the converter substance is chosen from substances, which, when optically excited, can luminesce, in particular fluoresce.

14. Light waver converter assembly, as claimed in claim 8, wherein the converter substance is chosen from substances, which, when optically excited, can luminesce, in particular fluoresce.

15. Light wave converter assembly, as claimed in claim 1, wherein the converter substance is chosen from inorganic dyes, comprising the auxiliary group elements and elements from the group of lanthanides and/or organic dyes, comprising the class of perylenes, aldazines, thioxanthenes and/or naphthalimides.

16. Light wave converter assembly, as claimed in claim 2, wherein the converter substance is chosen from inorganic dyes, comprising the auxiliary group elements and elements from the group of lanthanides and/or organic dyes, comprising the class of perylenes, aldazines, thioxanthenes and/or naphthalimides.

17. Light wave converter assembly, as claimed in claim 8, wherein the converter substance is chosen from inorganic dyes, comprising the auxiliary group elements and elements from the group of lanthanides and/or organic dyes, comprising the class of perylenes, aldazines, thioxanthenes and/or naphthalimides.

18. Light wave converter assembly, as claimed in claim 1, wherein the light guide is flexible.

19. Light wave converter assembly, as claimed in claim 2, wherein the light guide is flexible.

20. Light wave converter assembly, as claimed in claim 8, wherein the light guide is flexible.

21. Light wave converter, as claimed in claim 1, wherein the diameter of the exit port ranges from 1 to 10 mm.

22. Light wave converter, as claimed in claim 2, wherein the diameter of the exit port ranges from 1 to 10 mm.

23. Light wave converter, as claimed in claim 8, wherein the diameter of the exit port ranges from 1 to 10 mm.

24. Light wave converter, as claimed in claim 1, including a coupling or a thread.

25. Light wave converter assembly, as claimed in claim 1, wherein the converter substance is present in a quantity ranging from 0.005 to 5% by weight, based on a substance to be dyed.

26. Light wave converter assembly, as claimed in claim 1, wherein the converter assembly can be sterilized with hot steam.

27. Light wave converter assembly, as claimed in claim 1, wherein the light wave converter exhibits one of a form of a filter disk, a glass fiber or a glass rod.

28. Light wave converter assembly, as claimed in claim 1, wherein the converter assembly is a module of a polymerization lamp.

29. Use of a light wave converter as claimed in claim 1 in a dental process.

30. Use of a light wave converter as claimed in claim 28, for diagnostic purposes.

31. Process, comprising the steps: a) provision of a light wave converter assembly, comprising a light guide and a light wave converter, wherein the light wave converter exhibits a converter substance, which in use converts a part of incident light into light of a longer wavelength, and wherein the converted light is guided together with a portion of the unconverted light to an exit port, and b) connection of the light wave converter to a polymerization device, c) illumination and/or transillumination of hard tooth substance with light which is generated by the polymerization device and was converted by the light wave converter.

32. A photopolymerization system for use in dental procedures, comprising a light wave converter assembly with a light guide and a light wave converter,

wherein the light wave converter exhibits a converter substance operable to convert a part of incident light into light of a longer wavelength, whereby the converted light is guided together with a portion of the unconverted light to an exit port; and the light, converted by the converter substance, together with the unconverted light yields a light with the wavelength spectrum of the color white.

33. A photopolymerization system according to claim 32, wherein the incident light exhibits a wavelength ranging from 380 to 520 nm.

34. A photopolymerization system according to claim 33, wherein the incident light is generated by a polymerization lamp as a light source.